the present form substantially as they are. These pages, it may be remembered, provide for the 8 o'clock and special observations. The last-named page has been brought forward and takes the place of the instructions which now stand on page 4 of the present form. Page 5 of the present form, "Wind, number of miles and length of time from," has been stricken from the new form.

The board recommends that no further compilation be made of the data now recorded on page 5, Form 1001-Met'l, after December 31, 1904. The new form contains four additional pages on which it is proposed to enter the hourly temperatures, the hourly wind directions and velocities, and the hourly sunshine. These four pages replace the present Forms 1026-Met'l, Thermograph; 1021 Met'l, Hourly Wind Direction; 1022 Met'l, Hourly Wind Velocity, and 1070-Met'l, Hourly Sunshine. In other words the board has consolidated with Form 1001-Met'l four additional forms, and has thus brought together, in compact shape, information that is now carried on four different papers. The board desires to invite attention to the fact that the adoption of the above recommendations obviates the necessity of press copying the forms just mentioned.

The copy of Form 1001-Met'l retained at station will contain only a record of the observations at 8 a. m. and 8 p. m. (seventy-fifth meridian time), the special observations, and the summary of temperature and precipitation on page 8, except that the beginnings and endings of rainfall will not be entered on the last-named page. The beginnings and endings of rainfall will appear on the Central Office copy, however, in seventy-fifth meridian time, and the total precipitation there given will be for the period midnight to midnight, local standard time.

* * * * * * *

6. The board recommends that all instrumental records and the Daily Local Record be kept on *local standard time*, but that all data intended for the Central Office shall be recorded on seventy-fifth meridian time, except that the hourly temperature, the hourly records of wind velocity and direction, and the hourly sunshine shall be entered on local standard time.

7. The board recommends the discontinuance of the present form of Daily Journal and the substitution therefor of * * * a report to contain a description of unusual or remarkable atmospheric phenomena that have been observed during the month, and any matters that seem to call for special mention. It is not the intention that entries shall be made for each and every day of the month, but rather that a succinct narrative be given of the important events of the month, such as the occurrence of severe storms, cold waves, thunderstorms, or the prevalence of abnormal conditions extending over several days. It is believed that a copy of the notes made for the Daily Local Record will, as a rule, meet the requirements of the Central Office. This shall be known as the Monthly Meteorological Report.

8. The board recommends that the following data be no longer recorded:

(1). Extreme wind velocity. This information is of doubtful value. It must always be accompanied by a statement of how it was obtained, and it is liable to be confused with maximum velocities for five-minute periods; moreover when high velocities are attained it is difficult to accurately read them from the wind sheets.

(2). Number of days with mean temperature below 14° and 32°, and above 41°, 50°, 59°, 68°, 77°, and 90°, as recorded in the summary of Form 1001-Met'l, Form 1002-Met'l, and the Means Book. These data have been compiled for a number of years. They have not yet been used, so far as known to the board, in any manner. They can be obtained, if desired, from other records, and it is therefore believed that time and space can be saved by discontinuing their further compilation.

* * * * * * *

10. The board recommends that the present Means Book be known, hereafter, as the Climatological Record. It further recommends that the manner of entering the data therein, or the form of the volume, be changed as follows: Instead of entering the several elements for each month consecutively on seven pages, as at present, let them be grouped under several general heads, as Pressure, Temperature, Precipitation, etc., according to the character of the data, and entered separately.

* * * * * * *

Finally, the board believes that the Climatological Record should contain the following data:

Pressure (reduced to sea level).—Highest; lowest; mean; absolute monthly range.

Temperature.—Monthly mean, departure from the normal; mean monthly maximum and mean monthly minimum; absolute monthly minimum and date; absolute monthly maximum and date; mean daily range; greatest daily range; absolute monthly range; mean monthly variability; lowest monthly maximum; highest monthly minimum; number of days with maximum 32°, or below, and 90°, or above; minimum 32°, or below, and zero, or below.

Relative humidity.—Mean a. m. and p. m.

Precipitation.—Total amount for the month, departure from normal; greatest amount in twenty-four hours, amount and date; one inch an hour or over, total amount and date; 2.50 inches in twenty-four hours, amount and date; number of days with .01 inch and over, .04 and over, .25 or more, 1.00 or more; total depth of snowfall; number of days with snow; snow on ground at end of month; greatest snowfall in twenty-four hours; greatest depth of snow on ground and date.

Wind.—Total movement; prevailing direction; average hourly velocity; maximum velocity, direction, and date.

Weather.—Actual hours of sunshine, percentage; average cloudiness, a. m. and p. m.; number of days clear, partly cloudy, cloudy; number of days with fog or hail; thunderstorms; auroras; solar halos; lunar halos.

Daily and hourly data.—Daily maximum, minimum, and mean temperature; daily precipitation; daily snowfall; hourly values of pressure, temperature, wind, and sunshine.

* * * * * * *

Before closing this report the board desires to urge the importance of devising some method of recording the cloudiness at night and the beginnings and endings of light precipitation. The board recognizes the very great importance to stations of retained copies of the wind sheets, Form 1017-Met'l. It is understood that as yet no means have been devised whereby such copies can be had. The hope is expressed that the Instrument Division of the Central Office may be able to take up the problem and eventually solve it.

WEATHER BUREAU MEN AS INSTRUCTORS.

Prof. H. J. Cox, Chicago, Ill., delivered an address upon Recent Advances in Meteorology before the earth science section of the Central Association of Science and Mathematics Teachers at its fourth annual convention, held in Chicago, November 28.

Mr. H. W. Richardson, Local Forecaster, Duluth, Minn., reports that a class of about twenty students from the Blaine High School of Superior, Wis., visited the Weather Bureau office at Duluth on November 21. After showing the visitors the instrumental equipment, Mr. Richardson gave them a somewhat extended, though informal, lecture upon the general work and methods of the Weather Bureau.

Mr. J. P. Bolton, Observer, Fresno, Cal., lectured on November 28 to the physical geography class of the Fresno High School.

Mr. E. C. Vose, Section Director, Parkersburg, W. Va., is conducting a course of study in practical meteorology for the class in physical geography of the local high school. The study began early in November, and forty minutes each week are devoted to the work.

Mr. George T. Todd, Observer, Wichita, Kans., on November 17 and 18, 1904, addressed the high school class in physical geography, which came to the office in two sections. The instruction consisted of an explanation of the instruments, weather maps, and charts, the value of the records, and some remarks on weather forecasting.

ASSMANN'S SOUNDING BALLOONS AT THE ST. LOUIS EXPOSITION.

It is generally known that some years ago the Weather Bureau prepared to undertake a series of balloon ascensions to great heights from some point in the interior of the continent, but that owing to a change of plan the Bureau is now preparing to make these ascensions first from Mount Weather.

Meanwhile the aeronauts of the German meteorological office brought to this country for exhibition a very complete collection of balloon apparatus, and with this apparatus the officials of the Blue Hill Observatory have made a number of soundings from the grounds of the World's Fair at St. Louis. Four balloons were sent up in September, reaching altitudes of nine or ten miles, and all of the records were secured. The balloons are what are called Assmann's expansible and exploding balloons. They are made of thin India rubber, about a yard in diameter, and burst when the pressure of the gas inside, relative to that on the outside, has distended the balloon sufficiently to burst it. The balloon being free is carried hori-